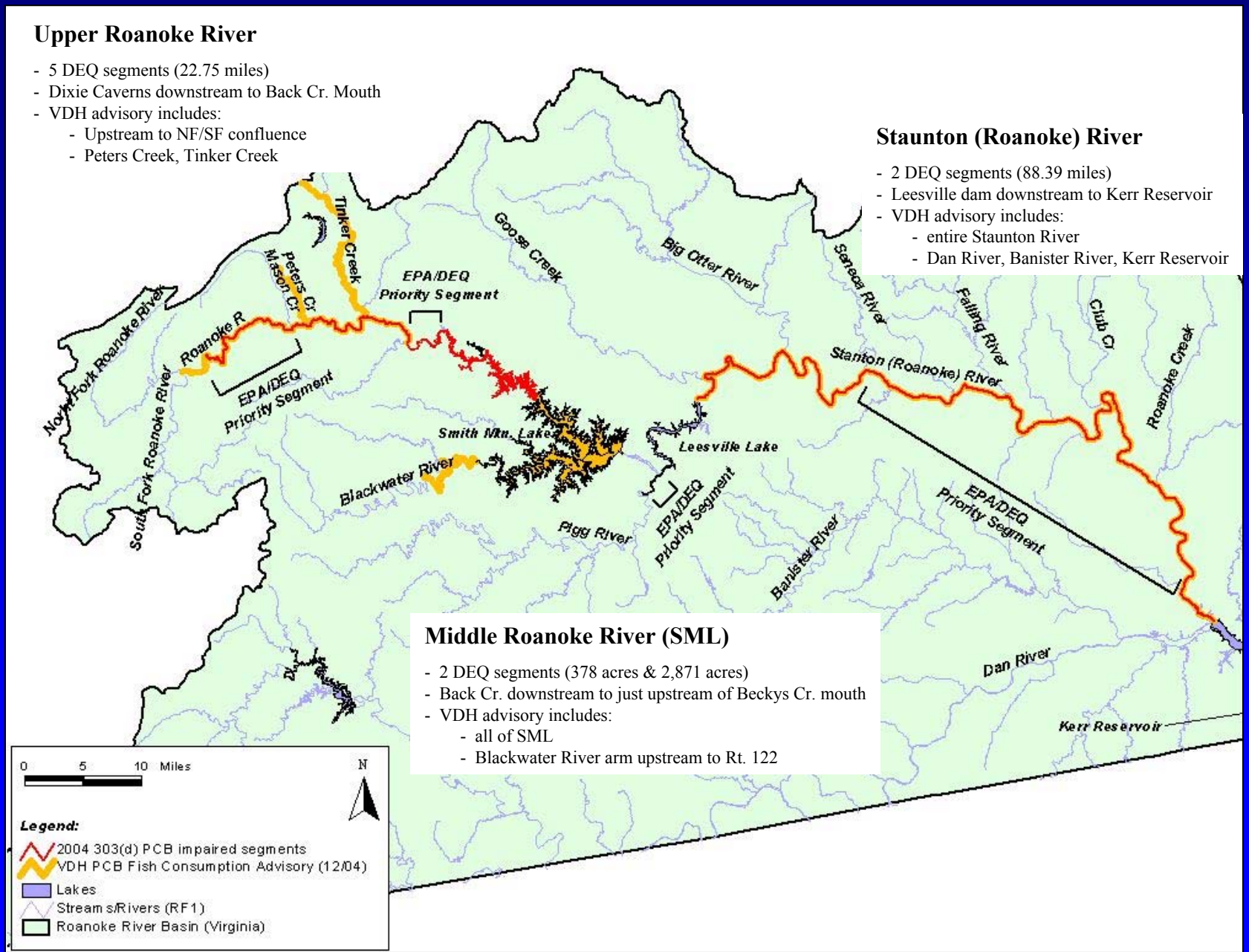
PCB Total Maximum Daily Load Development for the Roanoke (Staunton) River

March 22, 2005

PCB Study Overview

- Scope: Develop PCB TMDLs for Roanoke River PCB Impaired Segments
- Watershed Division:
  - Upper/Middle Roanoke (including SML)
  - Staunton River
- Consider all PCB sources in the watershed
- Study Components:
  - Data Review and Source Identification (*preliminary report completed)
  - Develop monitoring plan and conduct sampling
  - Identify and characterize PCB sources
  - Develop watershed/river model to assess PCB impacts and calculate TMDLs.

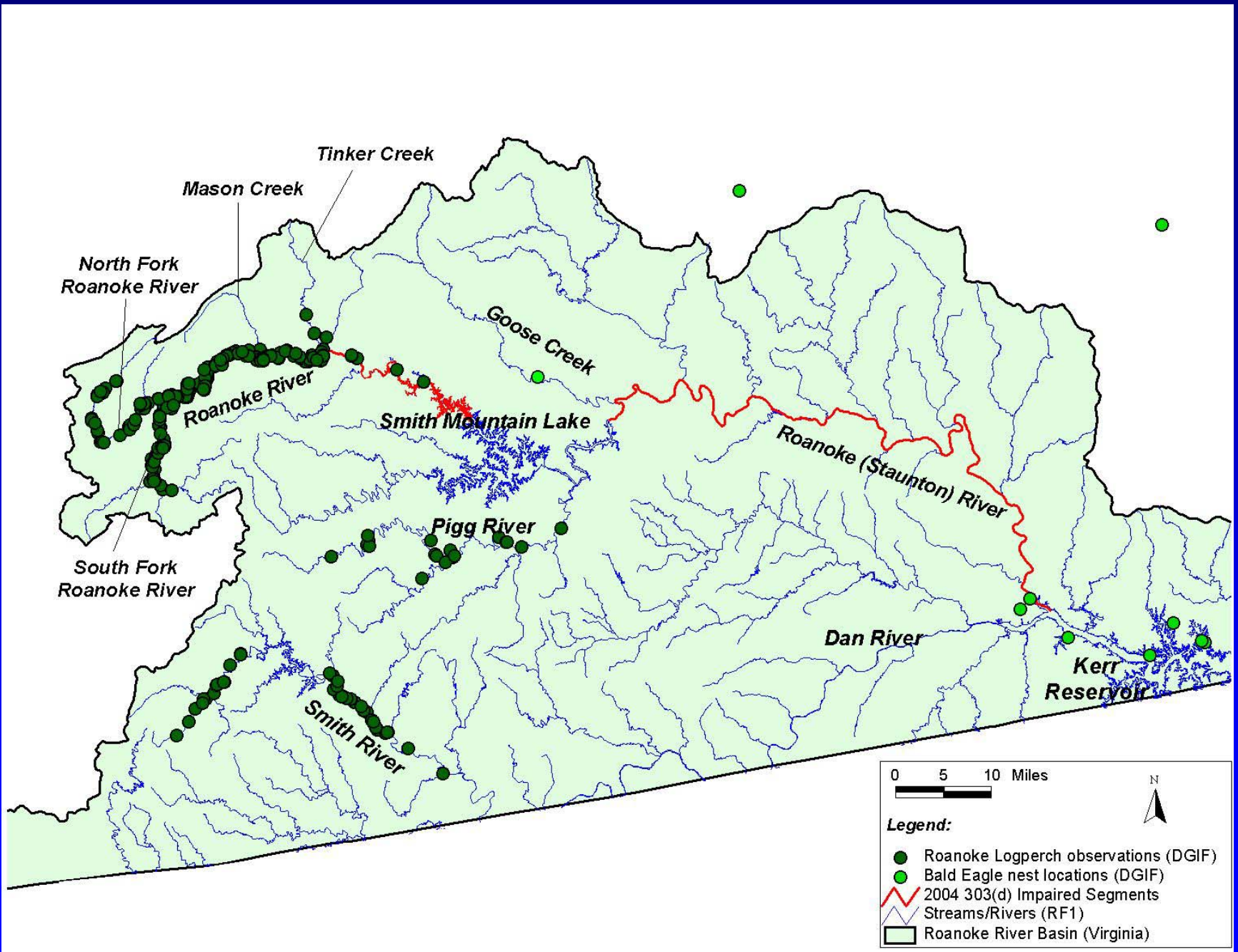
PCB Impaired Segments and Fish Consumption Advisories



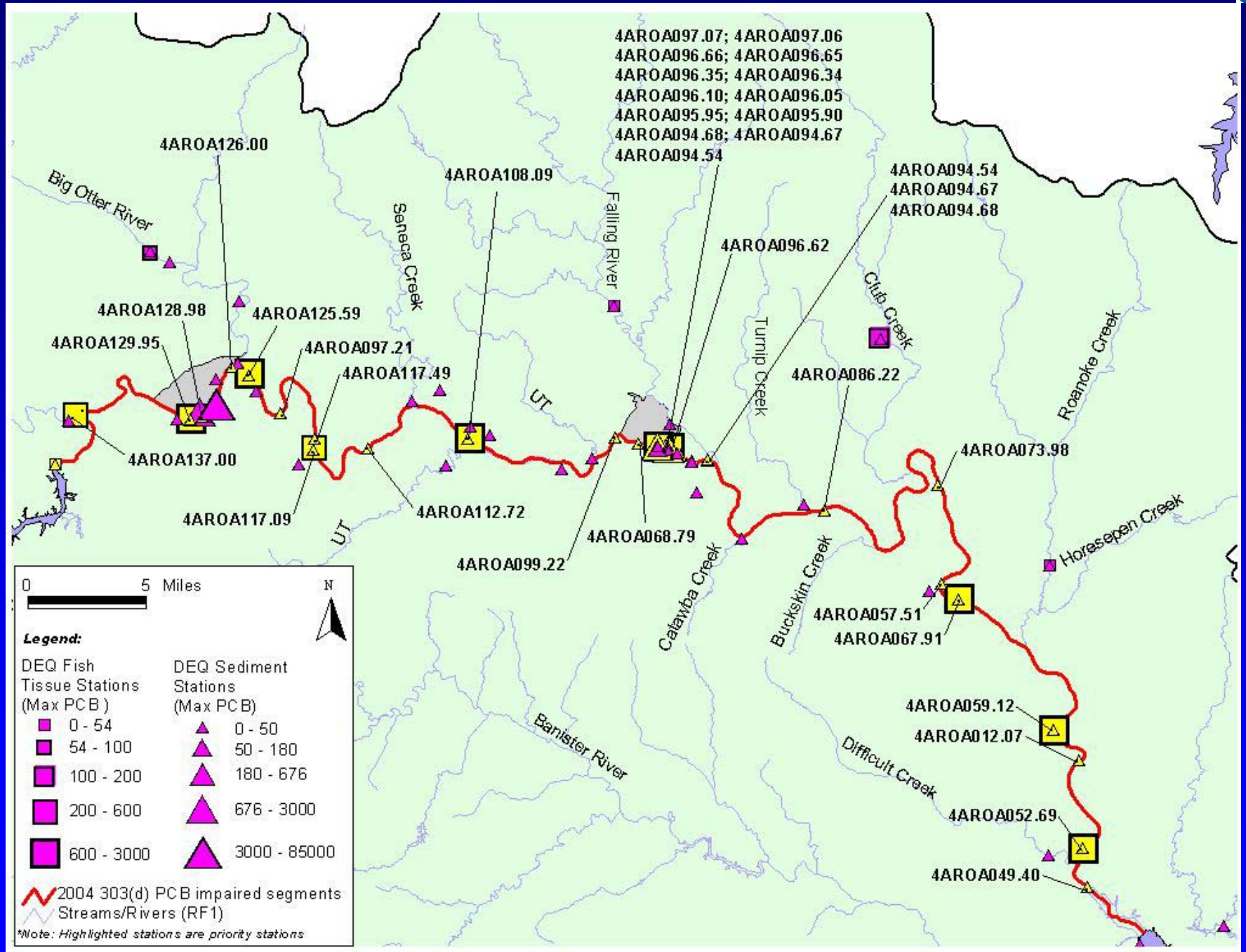
PCB Characteristics

- PCBs are hydrophobic and tend to adsorb to soil particles.
- PCBs typically accumulate in sediment depositional areas ("hot spots").
- PCBs bioaccumulate in animal tissues and have an affinity for lipids (fatty tissue). Food chain bioaccumulation is a concern.
- SML and Leesville Lake trap sediments (Staunton River segment is downstream). PCB problems below Leesville Dam likely originated from local sources, although historic upstream inputs may have traveled downstream prior to dam construction (circa 1965)
- Human Health concerns (fish consumption)
- Endangered Species concerns
  - Roanoke Logperch (*Percina rex*)
  - Orangefin Madtom (*Nocturus gilberti*) – threatened status
  - Bald Eagles

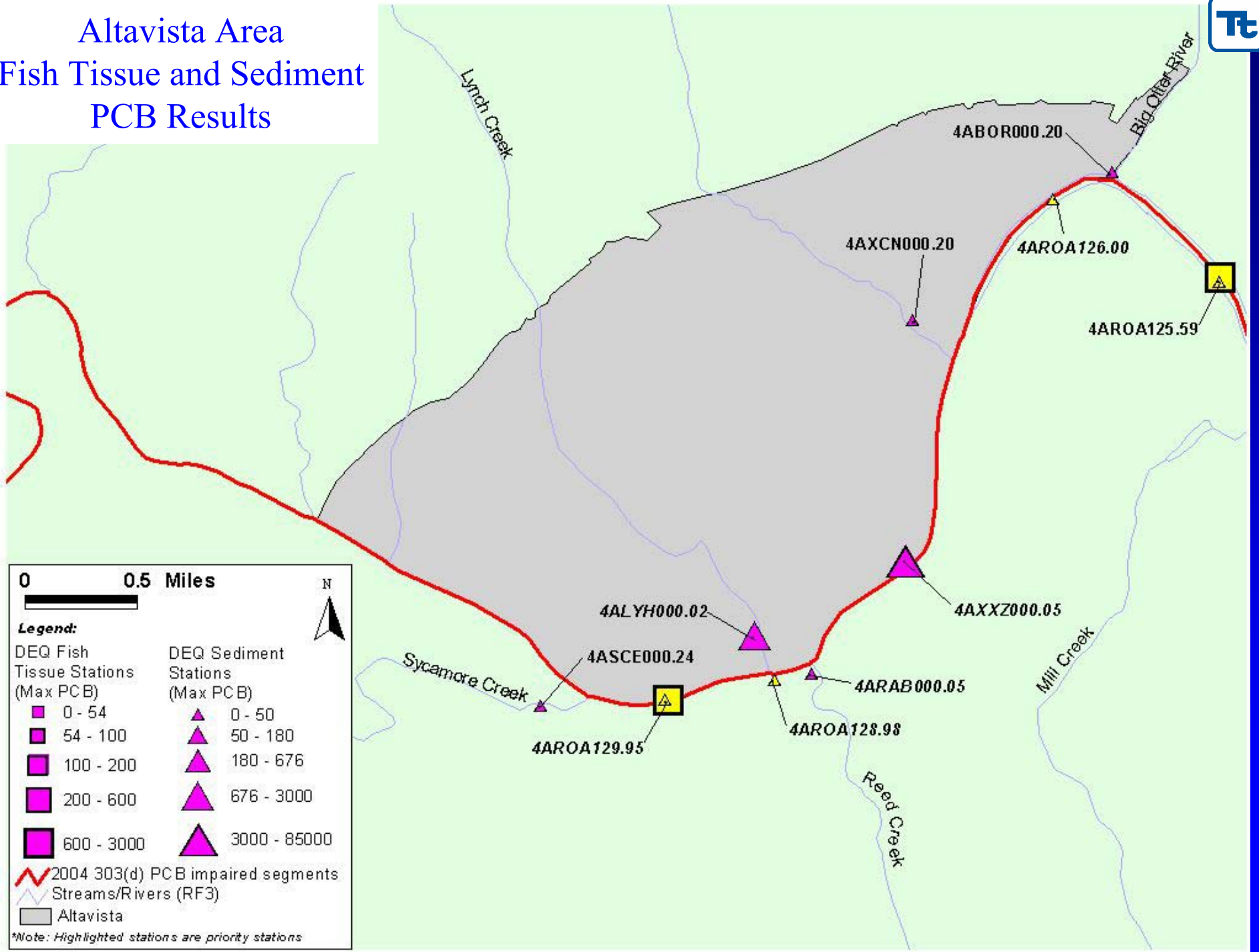
Endangered Species Observations



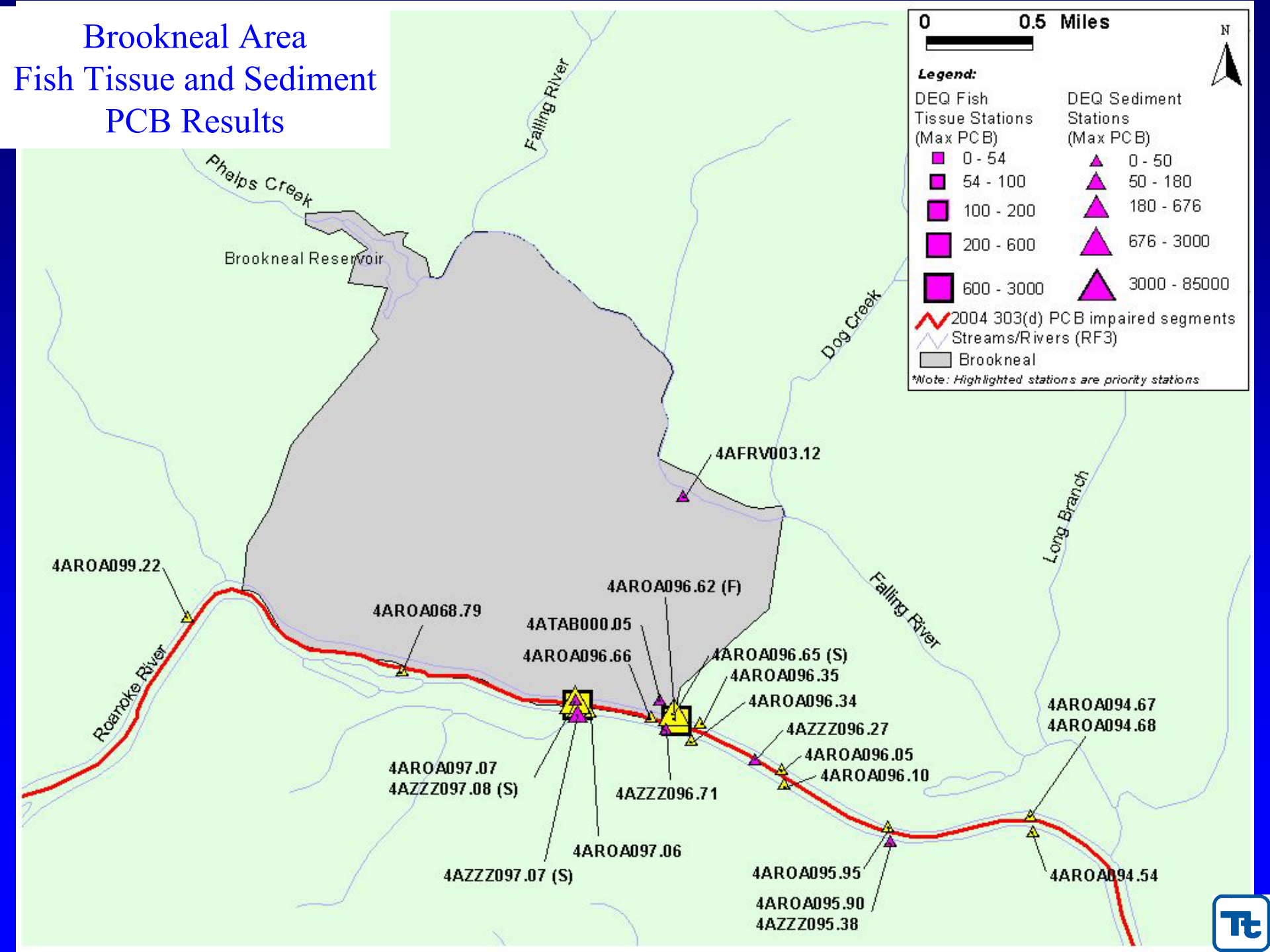
PCB Spatial Analysis (max. conc.) – Staunton River



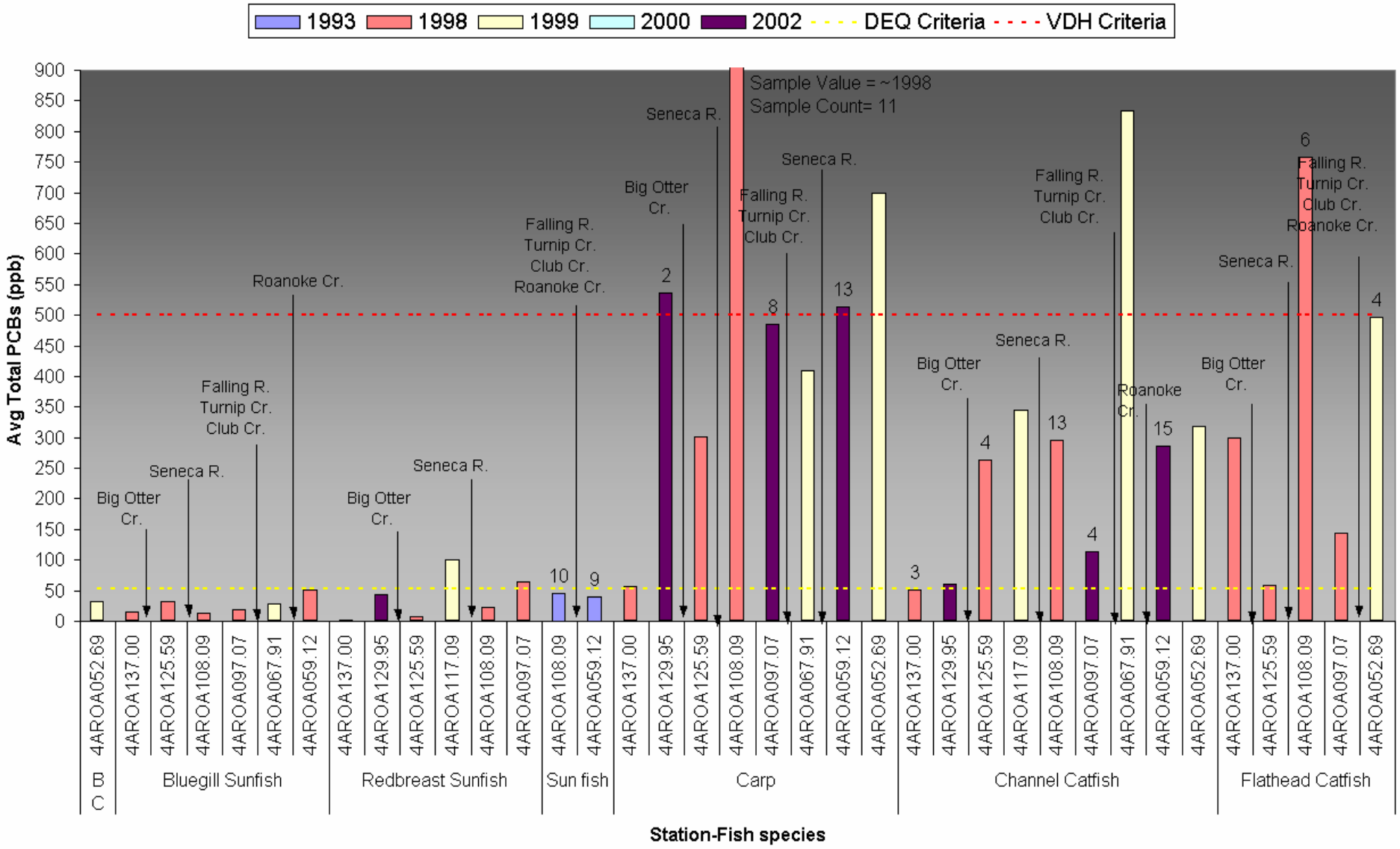
Altavista Area
Fish Tissue and Sediment
PCB Results



Brookneal Area
Fish Tissue and Sediment
PCB Results



Lower Roanoke Stations - Fish Species Avg PCB Tissue Concentration



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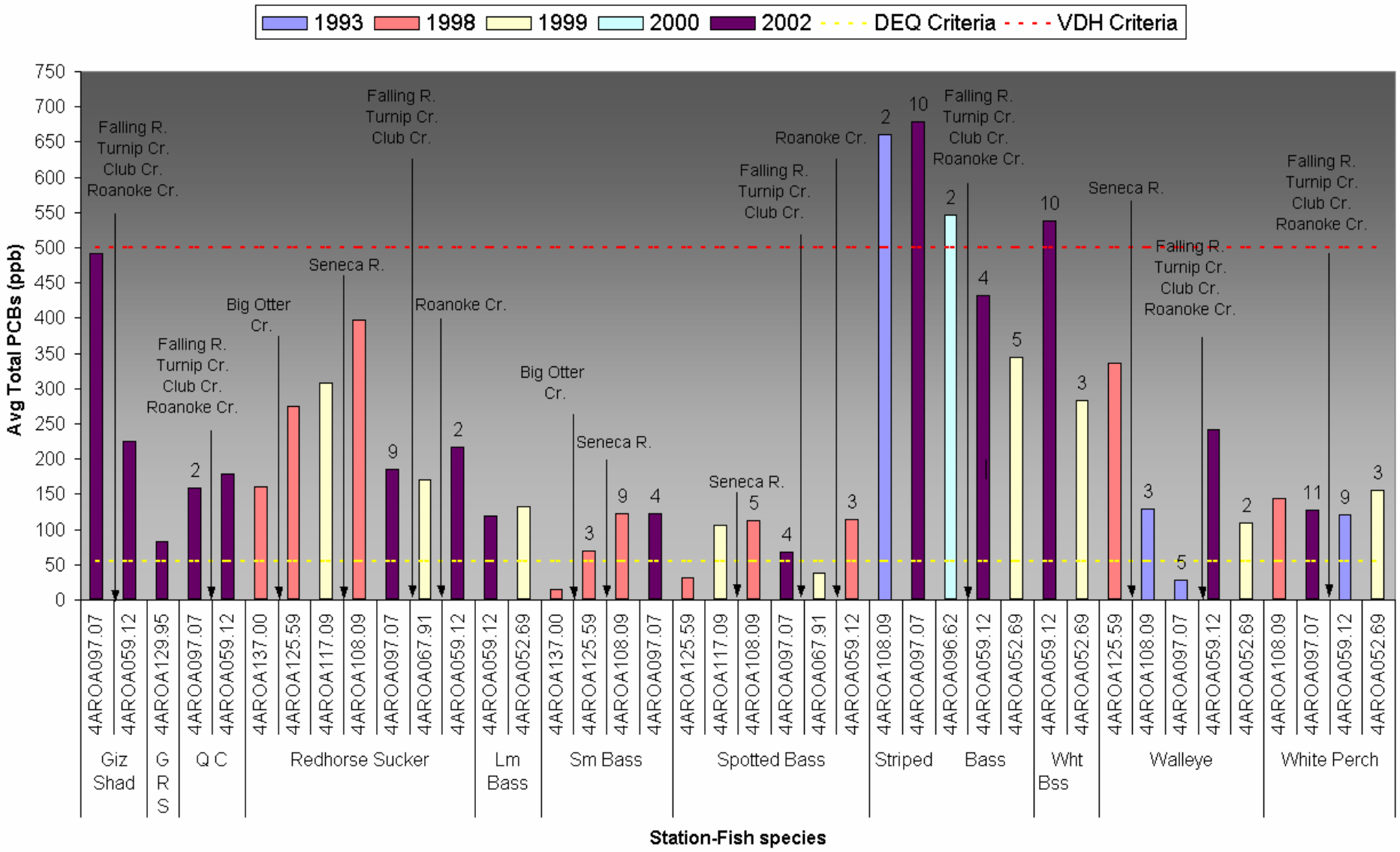
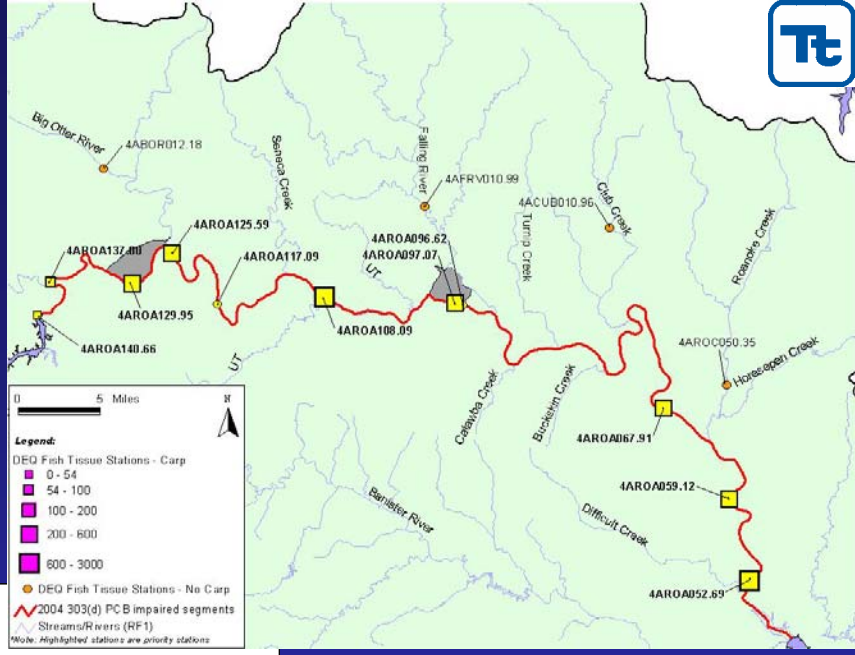
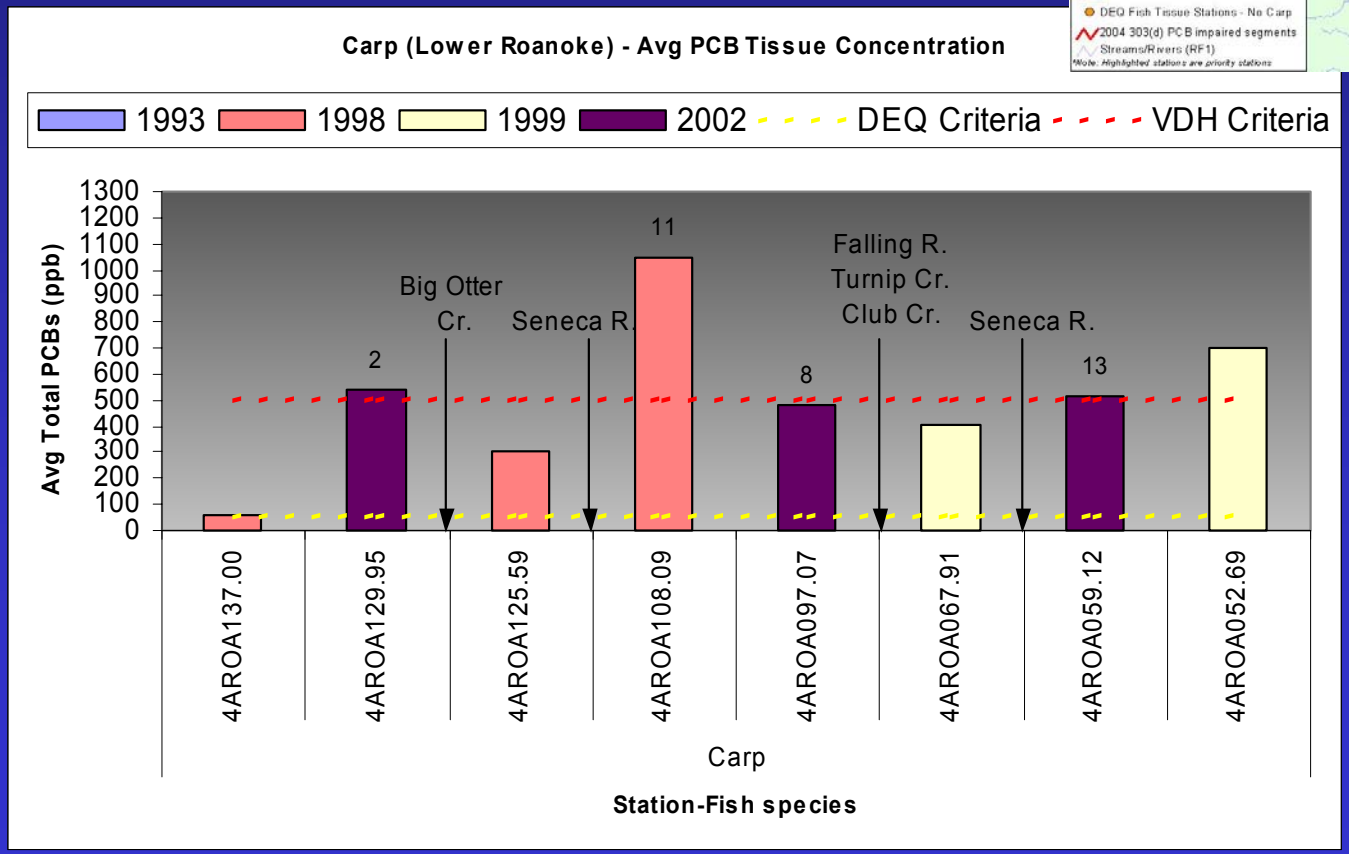
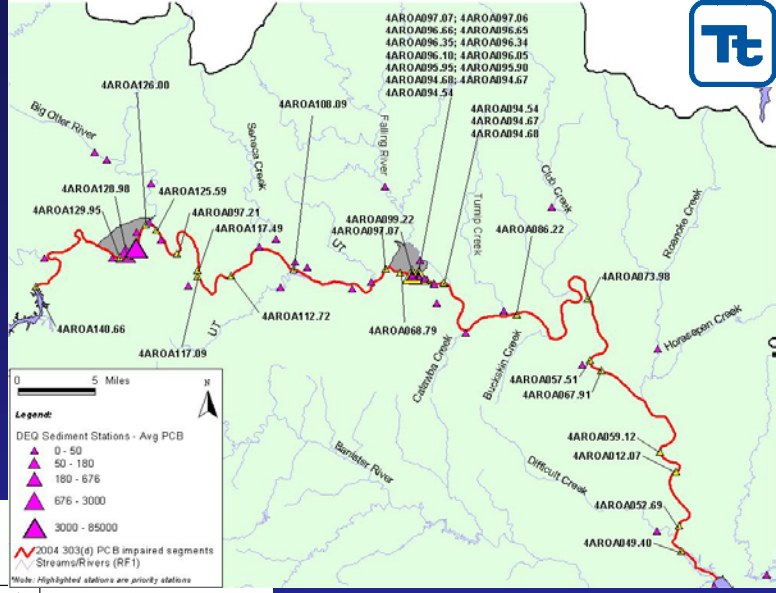


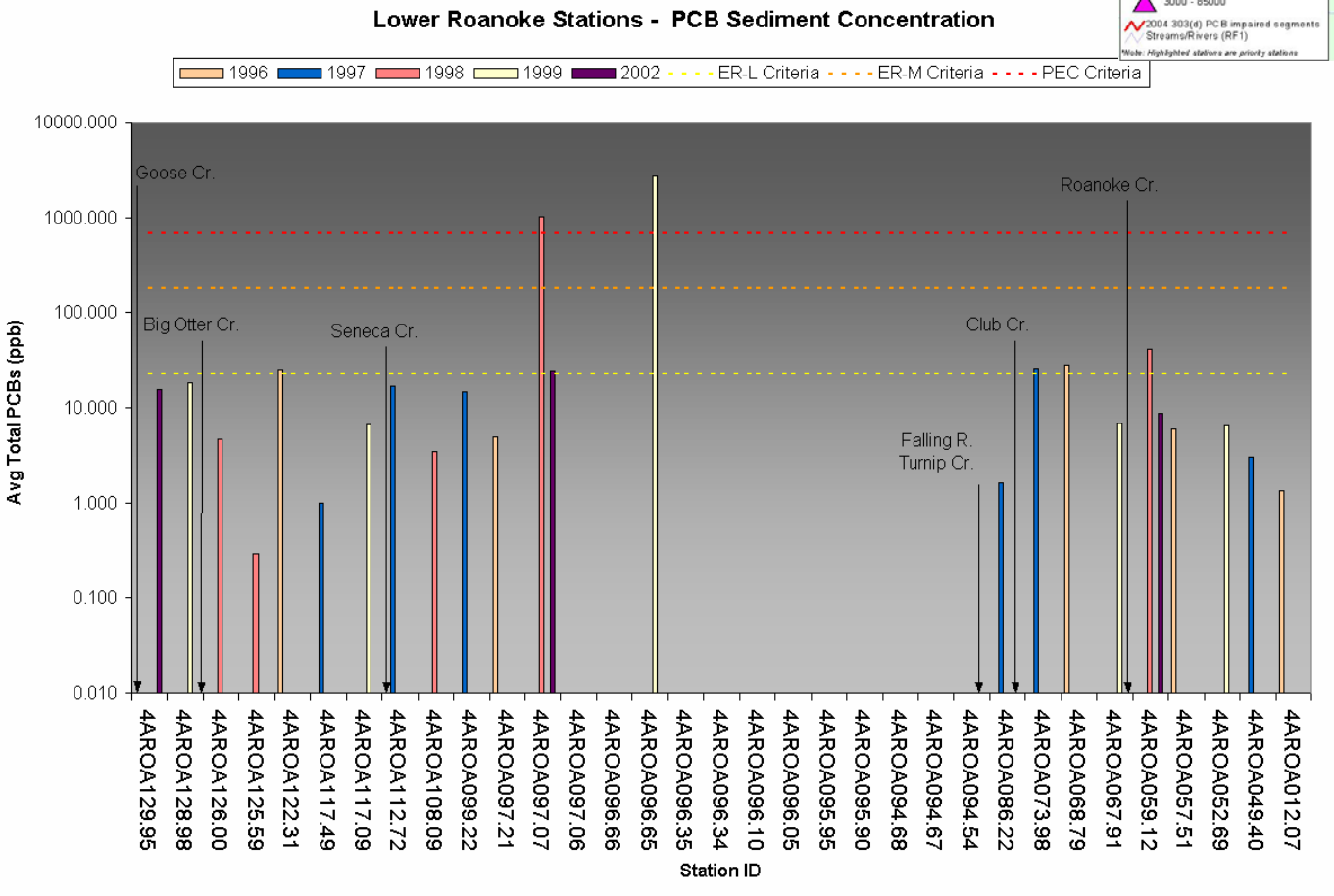
Carp PCB Concentrations
Staunton River





Sediment PCB Concentrations Staunton River





PCB Source Identification Process

- Review PCB fish tissue and sediment data
- Obtain information on active and legacy sources of PCBs in the watershed
- Review Staunton River pilot study findings and other source assessment information
- Consult with local stakeholders
- Conduct additional monitoring as necessary

Staunton River PCB Study Milestones

- Intensive PCB monitoring and source identification efforts began in 1998
  - 1993 Roanoke River Basin PCB fish tissue results published
  - VDH issued fish consumption advisory for the Staunton River

- Staunton River Citizens Advisory Committee formed

- DEQ special study initiated to assess the extent of PCB contamination and to help identify PCB sources in the watershed.
  - Developed monitoring plan and collected fish tissue and sediment samples
  - Reviewed landfill files, discharge permits, pollution complaint reports, etc.
  - Identified facilities that may have used PCBs in the past.
  - Conducted site visits and collected soil, sediment, and water samples.
  - Intensive monitoring around Altavista and Brookneal

- VDH fish consumption advisory area extended – entire Staunton River

Known and Potential Sources

- BGF Industries
  - Legacy contamination. No active use of PCBs onsite.
  - Soil and water samples collected at various locations
  - Elevated PCB concentrations found in soil samples collected onsite, in an unnamed tributary adjacent to the site, and in a stormwater ravine
  - Preliminary remediation plan developed by BGF – DEQ is currently reviewing

- Altavista STP
  - High PCB levels found in wastewater storage pond (emergency overflow pond). DEQ sampled residual biosolids
  - PCBs likely came from industrial waste discharges to the plant prior to 1980
  - PCBs not detected in surface water samples and in groundwater samples from monitoring wells located around the pond.
  - Voluntary Remediation Report (VRP) submitted to DEQ on 9/30/03
  - Remediation recommended: Consolidation of the biosolids and containment by a vegetative cap.

Known and Potential Sources

- Lane Furniture – Altavista
  - Phase II site assessment found detectable levels of PCBs in soil samples. Results were less than TSCA cleanup levels.
  - PCB usage notes:
    - Former use of PCBs in hydraulic wood press and in drying process
    - Residual wood debris/ash that may have contained PCBs was dumped.
    - Information suggests transformers were stored onsite – status unknown
  - DEQ conducted site visit in July 1999. Investigated 2 landfill sites.
  - First landfill site has been inactive since before 1974
  - Second landfill site used to dump wood debris and commercial waste. Barrels and other debris noted during site visit.
  - DEQ proposed additional monitoring. Safety concerns noted.

- Other possible PCB sources noted:
  - AEP field stations and storage facilities (old transformers)
  - Other industrial facilities and landfills

- Brookneal area – additional monitoring and site investigation needed. Sampling results indicate high PCB levels in sediment and fish tissue

Next Steps

- Continue review of available PCB source information
- Consult with local stakeholders to identify additional source information
- Identify data gaps
- Develop sampling plan to help identify PCB sources and "hot spots"
  - Altavista area well studied
  - Brookneal (high sediment concentrations noted)
  - High fish tissue concentrations noted downstream of Goose Creek (upstream of Altavista)